Theme IV (Agenda Item 6.0) Organization and Priorities

NOAA FISHERIES

Southwest Fisheries Science Center

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Theme IV: Organization and Priorities:

a) Does the Center/Region schedule stock assessments in a manner that meets national standards and regional needs?

i. What protocols are used to prioritize need, frequency and appropriate level of stock assessments?

ii. Has the Center reasonably balanced Council, other domestic and international stock assessment needs as well as additional analytical and review demands?

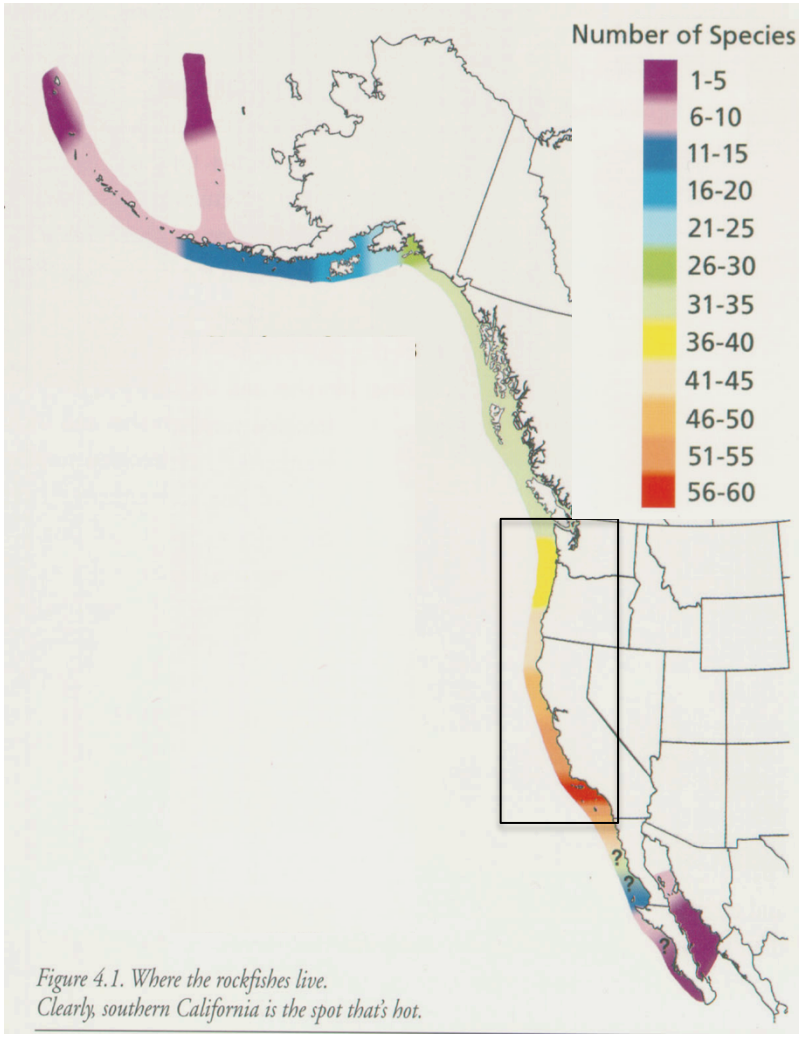
iii. How well does the Center involve internal and external clients and stakeholders in priority setting and the assessment process?

iv. Are the Center's scheduling and scale (e.g., benchmarks and updates) for individual fishery stock assessments balanced with Center resources, and regional, national and international needs?

v. What steps are the primary bottleneck in the number and timeliness of stock assessments each year: surveys, input data processing and management, assembly of assessment reports, ability to address questions from previous assessment, availability of assessment scientists, and review scheduling? Are any excessively limiting?

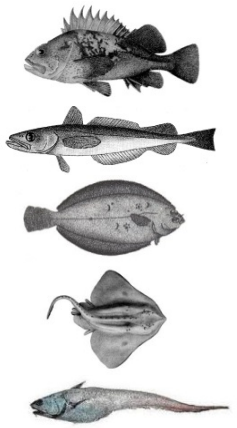
b) Is the Center prioritizing the appropriate initiatives and research areas to address current and anticipated stock assessment needs, including connection of stock assessments to broader ecosystem investigations?

West Coast Groundfish, reminder..



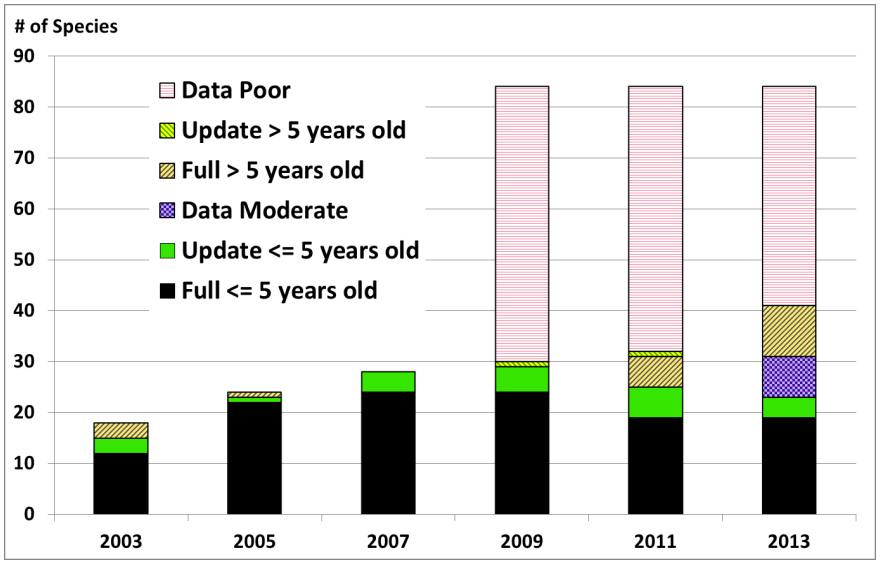
Love et al. (2002)

"Rockfish"	63
Roundfish	6
Flatfish	12
Elasmobranchs	6
"Others"	3
Total:	90

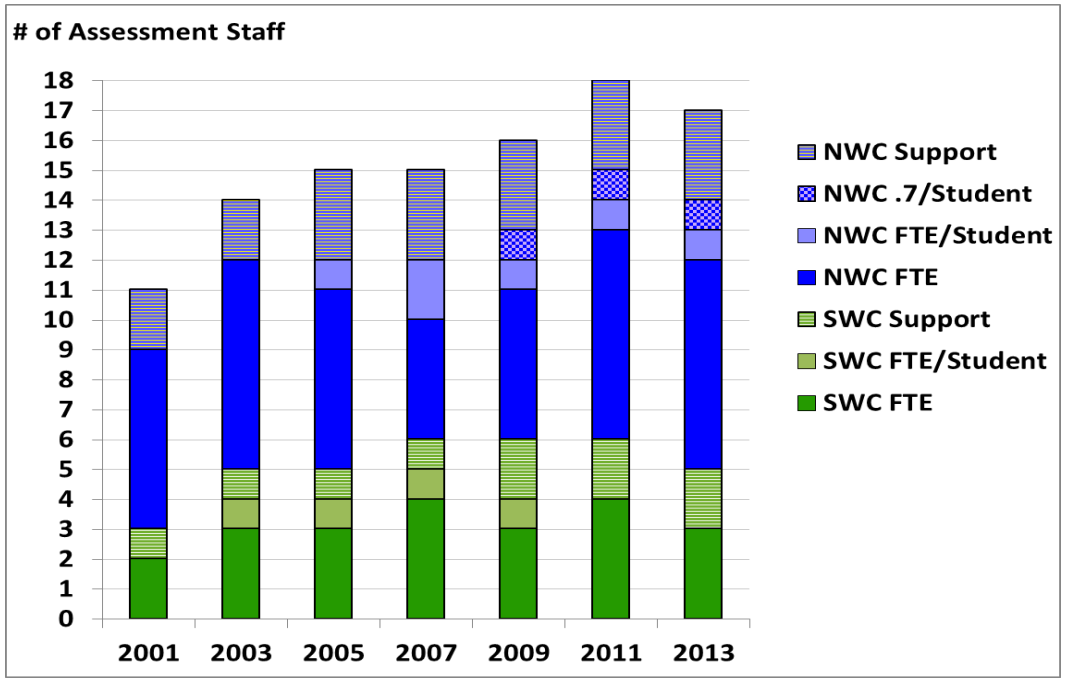


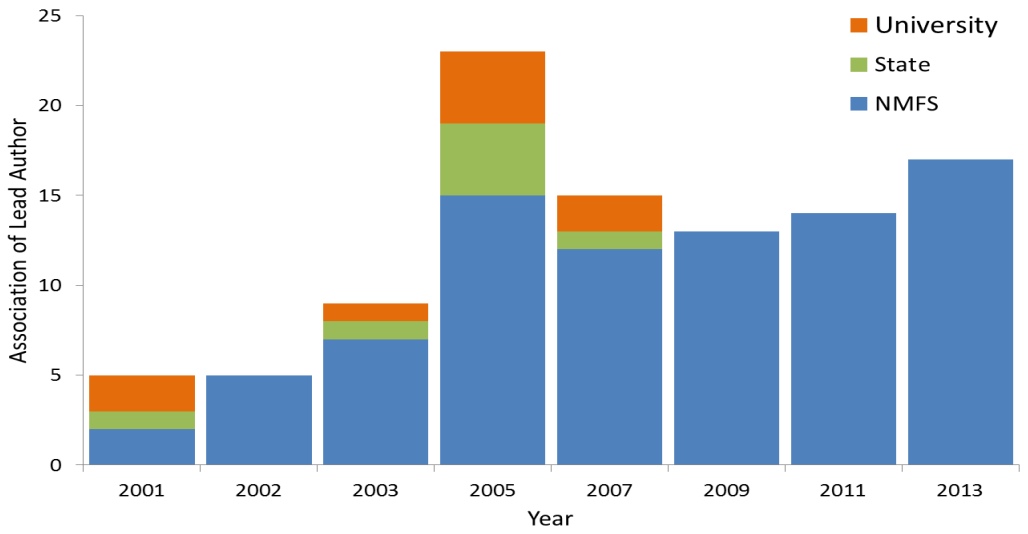
- As mentioned, the Groundfish FMP includes 90 species, most of the very specious genus *Sebastes* (diversity greatest in California). Most are data poor, of relatively minor significance to fisheries (but may still be highly vulnerable)…

Annual Assessments, by Type



- Historically (pre-2000), SWFSC did ~1/3rd of "full" stock assessments, slightly less in period since (greater role of NWFSC, declining role of states, others)
- SWFSC has focused on southern rockfish, particularly nearshore and shelf species of high importance to recreational fisheries and other CA stakeholders





Staffing Levels

- Slight increase in total (NWFSC and SWFSC) assessment staff in recent years has been countered by a decline in state involvement
- Need for ACLs for all species has required additional investments in developing data poor and data moderate approaches, reduces capacity for full benchmark assessments
- Ability to develop and improve data for nearshore (no fishery independent data) will require new resources (surveys, personnel, methods)

Recent Assessment History, part 1

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	% of SB_0	in year
Bocaccio	F		F		F		F		U		U	31%	2013
Canary rockfish (rf)			F		F		U		U		cr	23%	2011
Cowcod	U		F		F		U		cr		F	34%	2013
Darkblotched rf	U		F		F		U		U		F	36%	2013
Lingcod	F		F				F					74%	2009
Pacific ocean perch	F		F		U		U		F		cr	19%	2011
Pacific hake/whiting		F	F	F	F	F	F	F	F	F	F	72%	2013
Widow rf	F		F		U		F		F			51%	2011
Yelloweye rf			F	F	U		F		U		cr	21%	2011
Black rf	F				F							53%	2007
Cabezon (CA & OR)	F		F				F					49%	2009
Petrale sole			F				F		F		F	22%	2013
Sablefish			F		F				F			33%	2011
Dover sole			F						F			84%	2011
Shortspine thornyhead			F								F	74%	2013
Longspine thornyhead			F								F	75%	2013
Blackgill rf			F						F			30%	2011
English sole			F		U						DM	89%	2013
Yellowtail rf	U		U								DM	69%	2013

Periods highlighted in pink indicate years in which a stock was managed under a rebuilding plan

F = Full, U = Update, DM = Data-moderate, cr = Catch report

Recent Assessment History, part 2

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	% of SB_0	in year
California scorpionfish			F									80%	2005
Gopher rf			F									97%	2005
Kelp greenling (OR)			F									49%	2005
Starry flounder			F									50%	2005
Vermillion rf			F								DM		
Arrowtooth flounder					F							79%	2007
Blue rf					F							30%	2007
Chilipepper rf					F							71%	2007
Longnose skate					F							66%	2007
Shortbelly rf					F							73%	2007
Greenstriped rf							F					81%	2009
Splitnose rf							F					66%	2009
Greenspotted rf									F			35%	2011
Spiny dogfish									F			63%	2011
Aurora rf											F	64%	2013
Rougheye/bl.spotted rf											F	47%	2013
Pacific sanddabs											F	96%	2013
Brown rf											DM	40%	2013
China rf											DM	55%	2013
Copper rf											DM	59%	2013
Rex sole											DM	79%	2013
Sharpchin rf											DM	89%	2013
Stripetail rf											DM	78%	2013

F = Full, U = Update, DM = Data-moderate

Groundfish Assessment Prioritization

- Prioritization and process has historically been done in close collaboration with the PFMC (Biennial cycle, TORs, species selection, role and limits of STAR Panels).
- NWFSC and SWFSC have guided Council decisions on priorities based on a balance of Council needs (rebuilding species have been a strong priority) and availability of data, staff.
- Process is somewhat ad-hoc but is generally transparent and open. Council also receives input from SSC (distillation of quality of last assessment and ability to address data or research needs), advisory bodies (Groundfish Management Team, Groundfish Advisory Subpanel), and public.
- A several meeting cycle typically leads to a reasonable plan.
- National Assessment Prioritization Effort should help guide a more rigorous approach in future (Methot working group)

Ongoing efforts at NMFS level to develop an Assessment Prioritization Process

- Currently, stock assessment scheduling is region-specific, done jointly between Science Centers, Councils, others
- OMB requested that NMFS develop a prioritization system for assessments, a NMFS working group was formed in 2011 to develop a system; Richard Methot (Science Advisor for Stock Assessments) has led effort (and can expand on process and progress)
- Data used in draft prioritization guidance include commercial and recreational fishery importance, ecosystem importance, stock biology (esp. natural mortality rate and recruitment variability), most recent stock status and unresolved uncertainties
- Objective is to fine-tune assessment frequency for important stocks to ensure timely supply of science, while making available some assessment effort for currently under-assessed stocks

Priority Recommendations for 2015

Background Information Pertaining to Selection of Groundfish Stocks for Assessment in 2015.

Species	Suggestions for 2015				Most Recent Assessment and Current Status					PSA	Fleet rank (2008-2012):					2012 catch as a % of		Survey info
											Comm. $		Rec. mt					
	Full	Up D	D-M	Dat Rpt	Cur Tier	Last year	Type	Last Dep.	Rbld?		All	H & L	All	CA	OR-WA	ABC *	OFL *	
arrowtooth fl.			x		2	2007	F	79%		1.21	**8**	48	52		**26**	21%	17%	
bank rf			x		2	2000	F			2.02	**30**	42	47	44		4%	3%	
black rf x2	**X**				1	2007	F	65%		1.94	**6**	**3**	**1**	**1**	**1**	53%	51%	
blue rf			x		2	2007	F	30%		2.01	33	**17**	**4**	**9**	**5**	33%	29%	
bocaccio	**X**				1	2013	U	31%	Y	1.93	42	**26**	**7**	**5**	**13**	20%	19%	
CA scorpionfish			x		1	2005	F	80%		1.41	36	**20**	**5**	**4**		65%	62%	
canary rf	**X**				1	2011	U	23%	Y	2.01	46	67	**17**	**19**	**12**	8%	7%	
chilipepper	x	x			1	2007	F	71%		1.35	**14**	**27**	**30**	**29**	39	17%	16%	
China rf	x		**X**		2	2013	D-M	55%		2.23	**25**	**12**	**16**	**15**	**10**	124%	104%	
cowcod	x			x	2	2013	F	34%	Y	2.13	73	56	45	42		11%	9%	
darkblotched rf	**X**				1	2013	F	36%	Y	1.92	**22**	**24**				22%	21%	
gopher rf			x		1	2005	F	97%		1.76	**12**	**7**	**10**	**7**		42%	39%	
kelp greenling x2	x		x		1	2005	F	49%		1.56	**18**	**10**	**15**	**17**	**6**	79%	59%	
lingcod x2	x	**X**			1	2009	Full	67%		1.55	**7**	**5**	**2**	**2**	**2**	28%	26%	
olive rf			x		3					1.87	47	31	**13**	**13**	31	21%	17%	
POP	x	x		x	1	2011	U	19%	Y	1.69	31	43				6%	6%	
petrale sole	x	**X**			1	2013	F	22%	Y	1.94	**3**	44	40	40	**19**	91%	87%	
quillback rf	x		x		3					2.22	35	**18**	**20**	**28**	**7**	169%	141%	
sablefish	x	**X**			1	2011	F	33%		1.64	**1**	**1**	42	48	**15**	66%	63%	
widow rf	**X**				1	2011	F	51%		2.05	**28**	41	33	32	**17**	6%	6%	
yelloweye rf	x			**X**	2	2011	F	21%	Y	2.00	61	45	**27**	33	**11**	25%	24%	

Key			
	Higher Priority	**X**	Recommended
	Lower Priority	x	Potential
	Constraining, if not ranked in top-30		

Assessment Portfolio Balance and Suitability

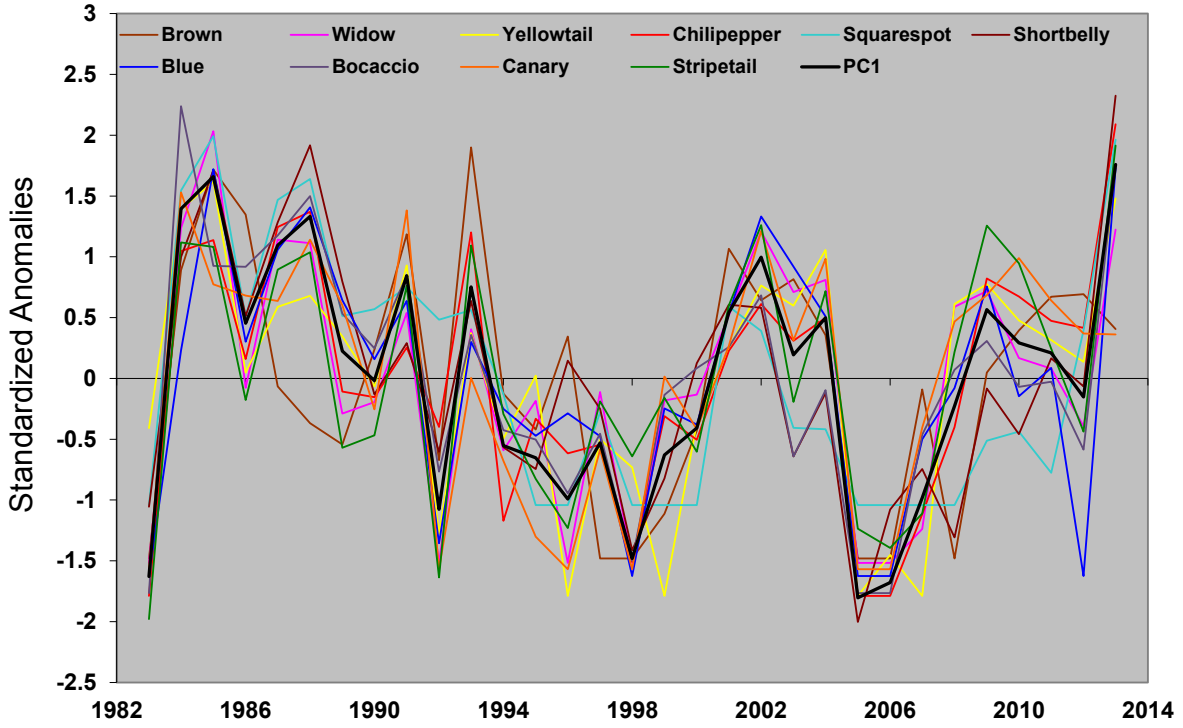
- As new surveys became available (often with short, volatile time series) in past decade, and assessment tools (SS2, SS3, other) evolved and changed rapidly, updates were perhaps underutilized (many faced non-trivial challenges, went to mop up panel). As surveys, data stabilize, may be greater potential to utilize updates and increase timeliness and frequency
- However, even if updates more frequently utilized, full benchmark assessments/updates likely cannot be conducted for all WC groundfish species: too little data and resources and too many species. Some level of data-poor/data moderate will be necessary in future. Relaxation of reporting requirements would also help increase overall throughput
- Increasing suite of tools (prioritization WG products, PSA, data poor and data moderate approaches) should lead to ability to conduct more assessments at a range of levels appropriate to both stock significance, prioritization and data availability

Balancing assessment needs with other demands

- **Pacific Fishery Management Council Support:** SWFSC has participated on GMT since 1980 (current participant is from Economics Team), as well as SSC, Ecosystem Plan Development Team, other Council sponsored workshops and activities
- **Support for other NOAA Science Activities:** NMFS OST working groups on SAIP revision, Assessment Methods, NS1 workshop, Assessment Forum, Vulnerability Evaluation, Stock Assessment Prioritization, Integrated Ecosystem Assessment, SWFSC Recreational Fishing Coordinator, RecFIN Statistics Subcommittee member, California Ocean Protection Council Science Advisory Team, Mentors for NMFS Population Dynamics fellows and Hollings scholars
- **Center for Stock Assessment Research (CSTAR):** A University California Santa Cruz program begun by Marc Mangel and Alec MacCall, Initial core funding (modest) by SAIP provided leverage for grants and contracts. Many UCSC faculty, post-docs and NMFS FTEs involved in support of ~15 graduate students and ~12 post-docs, many now FTEs (nearly all science centers) or faculty in academia, consultants for NGOs
- **Other Academic Service:** Other close ties (beyond CSTAR) University California Santa Cruz, serve on MS and PhD committees (UCSC, Hopkins/Stanford), also reviews and review panels for PFMC assessments, NSF panels, CA Sea Grant, NMFS internal RFP's (Collaborative Research, Habitat, FATE, others), peer reviewed lit., etc.

Rockfish Recruitment and Ecosystem Assessment Survey

- A 32 year time series of pelagic juvenile rockfish and other groundfish, forage species
- Conducted by FED Groundfish team, two dedicated FTEs, but all staff participate or support
- Supports indices of year class strength for assessments, numerous process and ecosystem studies
- Sea level anomalies preceding the survey are correlated with recruitment and community structure



Standardized anomalies from DGLM year effects for the ten most abundant species in the core area (updated from Ralston et al. 2013)

Are we striking a good balance?

- **Research**
  - Data poor/data moderate methods development
  - Analysis of uncertainty in assessments (meta-analytical approaches, model assumptions, delta method, etc.)
  - Recruitment survey: recruitment indices for assessments, recruitment process studies, ecosystem studies, oceanographic research, IEA support
  - Reproductive ecology research (maternal effects, time-varying fecundity, histological studies of skipped spawning, much with ELH team)
  - Continuing investigations of historical data to support catch reconstructions (Miller et al. 2014 PLOS One)
  - Collaborative research with stakeholders to improve survey methods and fishing practices, particularly in nearshore habitats (with TNC, others)
  - Other research includes ecosystem studies, Humboldt squid research, involvement in Pacific sardine and other CPS studies (MacCall)

- **Research**
  - Total of 54 peer-reviewed articles in last 5 years (2010-present) with involvement by FED groundfish assessment staff
    - Lead authorship on 19
    - About 30 on improving assessment methods
    - Others on recruitment processes, ecosystem interactions, Humboldt squid, other
    - An additional 6 technical memorandum (mostly related to assessment methods or databases)

Strengths, Challenges, Strategies

Strengths

- History of robust assessments using reliable tools, more recently encompassing emerging tools to better match methods to data availability for data poor and data moderate stocks
- Prioritization of assessments has been done in close collaboration with PFMC and NWFSC, process is iterative and transparent
- Balance among assessment workload and other important efforts (survey, methods development, research) is not ideal, but is generally tractable

Challenges

- Prioritization process is somewhat ad-hoc, not always full agreement among participants, greater predictability would facilitate priority setting of research, aging, other efforts
- Workload is greater than resources, an increase in benchmark assessments not feasible without new resources, to do all species, analyze all data borders on implausible (e.g., nearly 500,000 otoliths in FED inventory, perhaps 25% have been aged)
- Time lags between data availability, development of assessments, and implementation of management advice are anomalously long in WC groundfish process

Strategies

- More work to be done on developing a more rigorous prioritization process and identifying target assessment frequencies and types to balance needs with capacity
- Better utilization of updates (ideally with reduced reporting requirements) to increase timeliness and throughput
- Continue to recruit additional staff with expertise in data analysis, modeling, management strategy evaluation; better efforts to free up resources for methods development and other research would boost morale and productivity